

A Case Study of American Bicycle Culture:
How Cycling to Work *Works* in a Small Town in Kansas

By

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ABSTRACT

Small communities, like big cities, are trying to figure out what to do about bicycling. Especially when used for transportation, bicycling offers benefits to individuals such as increased physical activity and decreased costs associated with motorized travel. For small and big cities, alike, bicycling produces zero carbon emissions, causes less wear and tear on already strained road systems, and promotes a tightening up of sprawling landscapes. So far, what we know about bicycling comes principally from statistical surveys and quantitative research of large sample studies conducted in cities with existing bicycle infrastructure. But what we need to know about bicycling goes beyond the numbers to explore how cyclists interact with their communities. Learning how cyclists make it work can help communities design environments and policies to encourage more bicycling. And not just in places with bicycle friendly amenities but also in places that might be called bicycle “unfriendly”. This thesis reports on the results of a case study aimed at understanding how a small group of bicyclists make it work in a small military town in Kansas. The cyclists interviewed make it work by committing to biking to work, planning their lives around cycling, and overcoming obstacles. A major obstacle to bicycling is the sense that cyclists do not feel supported by the community. Feedback from this study can lead to a greater sensitivity to everyday dilemmas encountered by cyclists. Leaders and decision makers in places that do not actively encourage cycling can better understand how cyclists fit into their town’s sense of community.

ACKNOWLEDGEMENTS

I dedicate this to people who make biking to work *work* in places where you least expect it.

The topic of my thesis started showing itself to me the moment my family and I moved to Fort Leavenworth, Kansas in December 2008, and we decided that we could probably get around well on a bike here (once the snow melted). A series of fortunate events happened along the way to nudge me in this direction.

First, I visited the Sante Fe Bike Shop in downtown Leavenworth and bought a bike. Here I met Brendan Sheehan, Bike Shop owner, coffee connoisseur, and local bike hero. He never seemed to mind taking time to chat with me about bicycling.

It was my luck to meet Chris Dunn, City of Leavenworth Planning Director. I appreciate him and the staff at the City of Leavenworth for welcoming me as a graduate student and helping me get my bearings in a new town. Home is where the Army sends us, and I am grateful for the City letting me adopt it as my home for two and a half years. I wish the City the best as it moves forward with its first ever Bike Trails Plan.

I appreciate the support of Fort Leavenworth in making my research possible. Thank you to MAJ Molina, Director of Emergency Services, and the Command and General Staff College for granting me the necessary permissions to recruit cyclists. And thanks for being so nice about it.

I also wish to express gratitude to Professor Stacey White for the class project that provided the catalyst to get me started on an incredible journey. A journey that took me all the way to Bicycle City Copenhagen, Denmark where Michael Sommerville took us on a chilly but amazing bike tour of the city in January 2010. Here I thank my best friend for giving up a vacation in a warmer spot to come along with me to a place on Earth with very limited daylight hours.

To help pick up the parenting slack, I thank two very special people. First, my mom who moved from Texas and put her life on hold to move in with us while I devoted time to my studies. Thanks Mom! I could not have done it without you. To my daughter, Sofia, for hanging in there. And then there's my husband Felix who pushed me when I needed to be pushed and told me to stop when I was biting off more than I could chew. Thanks for knowing me so well.

And last but not least, I want to let my thesis committee know that I value and respect them tremendously. Thank you for having faith in me and giving me just enough rope to hang myself. Bonnie, Marcy, and Bill, you are my three amigos!

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CHAPTER 1: INTRODUCTION

What To Do About the Bicycles?

In the past twenty years, cycling rates in the U.S. have jumped more than seventy percent. Sounds impressive, huh? Until I tell you that the number of people biking for transportation, nationally, is still less than one percent (U.S. Census, 1990; U.S. Census, 2009).

In a country with a serious health and fitness problem¹, that is some slow progress.

Incorporating daily physical activity for many people is still a matter of sport, recreation or just more work to be done at the gym. While for a few folks, daily fitness goals are met by actively commuting to work on a bicycle. But the design of our communities does not always help us to bike to work. Public health leaders and researchers have turned their attention to the fact that land use and travel patterns affect the ability of Americans to get around using non-motorized methods of transportation such as walking and biking. This condition of separated land uses, isolated residential communities, and disconnected street networks, is known as urban sprawl. Other criticisms of urban sprawl range from the environmental impacts on land consumption and air quality to quality of life issues related to loss of community and mental well being. Urban planners and transportation engineers, once the facilitators of urban sprawl, are searching for ways to reverse these trends. Increasingly, they are looking for ways to promote non-motorized modes of transportation that encourage physical activity like walking and bicycling.

The *Rails to Trails Conservancy*, a national nonprofit organization dedicated to the proliferation of trail networks in America, describes “active transportation” as a movement evident in the “quiet trend of increased bicycling and walking [that] has been building for years

¹ According to the Center for Disease Control, more than 72 million people in the U.S. are obese.

among those seeking an affordable, healthy, clean and enjoyable way to get around” (Gotschi & Mills, 2008, p. 43). For the purposes of this study, I will focus on bicycling as active transportation. While most studies combine walking and cycling, this study will not because they “fill very different daily purposes for individuals, and pose different problems for facility planning and community design” (Krizek & Johnson, 2006, p. 33). For the most part, studies in this field are quantitative in nature (Aultman-Hall, et al., 2009, Krizek & Johnson, 2006, Saelens, et al., 2003, Sener, et al., 2009) relying heavily on surveys and indices to research and measure issues such as user preferences, effects of weather, neighborhood design, proximity to trails, and route characteristics. These quantitative techniques are preferred in practice because there is a misperception that they are the only tools available to generate “true” answers that are unbiased and less likely to yield results preconceived by the researcher or surveyor. Qualitative methods, on the other hand, can add to the possible courses of action in constructing social science research. This study will address the lack of qualitative insight into bicycling for transportation.

Case Study Approach

One such method is the case study. “The case study contains no greater bias toward verification of the researcher’s preconceived notions than other methods of inquiry. On the contrary, experience indicates that the case study contains a greater bias toward falsification of preconceived notions than toward verification” (Flyvbjerg, 2006, 237). Many studies on bicycling (Dill & Carr, 2003, Tilahun, et al., 2007) survey populations who do not engage in active transportation and explore their attitudes as to what would make them attempt the behavior in the future. Other studies investigate the behaviors, choices, and decisions made by active transportation commuters using solely the survey method (Sallis, et al., 2004). One of the

weaknesses of survey research is that participants may feel the need to anticipate what the researcher wants to hear by giving socially and politically acceptable answers (Babbie, 2002). For example, consistently more people tell surveyors that they voted than actually voted in elections (Wright, 1993). Studies on bicyclists tend to take place in larger communities where there is advanced infrastructure such as extensive bike lanes and strict street design standards to support these behaviors (Dill, 2009, Saelens, et al., 2003).

Although there are strengths and weaknesses to any type of research methodology, the survey is framed from the surveyor's perspective. It is possible that we may not fully understand the phenomena of bicycling enough to properly frame a survey. Urban planners and transportation professionals have been out of touch with non-motorized transportation forms for many decades. This removed understanding contributes significantly to the disjointed state of bicycling data. "The lack of detailed and accurate data on both behavioral and objective measures of environments likely represents the single most important issue to address in future attempts to isolate individual or groups of environmental predictors of walking and bicycling" (Moudon & Lee, 2003, p. 36). Two common research needs echoed through existing studies are: 1) the need to collect basic data such as pedestrian and bicyclist counts, and 2) the need to go beyond the numbers of people bicycling through qualitative investigation (Handy & McCann, 2011, Cervero, et al., 2009, Clifton & Handy, 2001, Orrick, et al., 2011, Replogle, 1995, Wilson, 2001).

Recently, Robert Cervero and other researchers employed case study techniques in an analysis of parking demand around transit oriented development residential areas (Cervero, et al., 2009). The study found that qualitative case studies identified important factors not found in the

statistical regression models employed and that these models “were unable to capture such nuanced relationships” (Cervero, et al., 2009, p. 35) among the reasons for the variation in parking patterns. This hints at an emerging desire even among the most stalwart quantitative experts to zoom in and take a closer look at transportation issues with qualitative research. “For the reader willing to enter this reality and explore it inside and out, the payback is meant to be a sensitivity to the issues at hand that cannot be obtained from theory” (Flyvbjerg, 2001, p. 238). This study will provide that intimate account of cyclists as a case study zooming in on American bicycle culture in a place where you might least expect it.

Study Importance

I first became interested in the topic of bicycling for transportation through a project for an environmental planning course my first semester of graduate school. The goal of the course was to explore behavior and attitude change with respect to environmental issues. I chose to conduct observational studies on the number of people riding their bikes to the Lewis and Clark Center at Fort Leavenworth, Kansas. Conveniently, this also happens to be where my family and I live. Through my observations, I learned that, although few in number, more people rode their bikes than I expected. I also learned that the Center provided a great deal of bicycle parking. Another component of the course was to study a plan or policy which related to the behavior of bicycling for transportation. I came across the City of Copenhagen, Denmark and their Bicycle Policy. I was so enthused and a little disbelieving about what I read in this policy that I visited Copenhagen in January of 2010 to see it with my own eyes. I travelled around the beautiful compact city on a bicycle using their extensive cycle track network. What an amazing experience. So here I was, back in Kansas, recently returned from one of the most bicycle

friendly cities in the world. Yet on Fort Leavenworth, I was witnessing people bicycling to work in this place that might be called “bicycle *un*-friendly”. How could this be? What I learned from the Copenhagen example is that they pay very close attention to their cycling population. They study cyclists meticulously to understand their behaviors and the motivations behind these behaviors. It made me think of places in the United States, and what can we do here to better understand our cycling culture. What better place to start than in my own backyard?

Responding to the research call for more qualitative inquiry, the purpose of my study is to explore the decision-making of a small group of bicyclists. These are people who travel on a bicycle onto Fort Leavenworth, Kansas from surrounding communities and from housing areas within the installation. The unit of analysis is the individual cyclist. The main research question is how do these cyclists make biking work for them? Answers to this question will help us understand how cycling fits into their lifestyles, what strategies they use, and how the built environment and policies shape their cycling experiences. My exploration of these cyclists’ reality is structured as follows. First, I will take you through what we know about bicycling culture in the United States as well as how we have come to know what we know. Then I will explain the breakdown of my investigation and the methodology I used. I also describe the Fort Leavenworth community and provide the reader with an understanding of Army culture as it relates to bicycling. Then I proceed to reveal the patterns I found and discuss the results of the study. I conclude with an analysis of what the results mean for improving bicycling and community health. Reading this, you will gain a greater appreciation for American bicycle culture as experienced by a small, yet diverse, group of people making bicycling work in a small midwestern town.

CHAPTER 2: UNITED STATES BICYCLE CULTURE

Evolution of Bicycle Policy

A review of the literature shows that bicycling is a topic studied across disciplines from transportation and urban planning to public health and economics. Each field contributes in a different way to the understanding of American bicycle culture. In history, the bicycle holds a special place in American popular culture. First invented in Germany, it became an important personal transport vehicle in the United States before the proliferation of the automobile.

“To youths, it gave speed; to women, freedom; and to many ordinary citizens, it was simply a source of great pleasure and utility. To all, it offered adventure and exercise. For the new breed of cyclist was an independent sort...” (Herlihy, 2004, 264).

As the country’s population transitioned from animal powered transportation to human and machine powered modes, bicyclists became advocates for the improvement of road surfaces during the Good Roads Movement at the turn of the twentieth century (Herlihy, 2004).

Eventually, bicyclists’ advocacy efforts led to the development of the National Highway System and expansion of the road network (Federal Highway Administration, 2008). But even then, as it is now, cities and governments were unsure of how to deal with bicycle traffic flow. Bicycles were, and are today, seen as dangerous to the pedestrian and a nuisance to the car. The role of the bicycle within the greater American urban planning paradigm is still under investigation. During a roundtable discussion on a visit to the University of Kansas, New Urbanist founder Elizabeth Plater-Zyberk remarked there are “lots of things left to be worked out. Like that bicycle thing” (Plater-Zyberk, 2010).

Modern federal policy towards the bicycle began, in earnest, with the inclusion of bicycle and pedestrian provisions in the 1973 Bicycle and Pedestrian Legislation (23 USC 217, 2009). In 1991, the federal government required, for the first time, that state departments of transportation fund bicycle and pedestrian coordinators whose “primary functions are to institutionalize nonmotorized transportation within a larger state agency and to increase the number of citizens safely bicycling and walking in the state” (Pedestrian and Bicycling Information Center, 2011). Since then, federal policies and programs have continuously improved by expanding funding opportunities for bicycle facilities, adding significant language to legislation, and increasing the quality of information available to states and metropolitan planning organizations. Ever more, local governments, big and small, assume most of the leadership and funding responsibilities for bicycle planning.

“Indeed, because of the local scale of most bike/ped projects, local governments may be the primary driver of regional bike/ped spending. The strength of the local government role could serve as an important counterbalance to the road orientation of most state DOTs.” (Handy & McCann, 2011, p. 29).

Cities, from Boston to Omaha, have hired their own bicycle coordinators and have been successful in finding a combination of public and private funds to build bicycle facilities and promote cycling (City of Boston, 2011; City of Omaha, 2011). Where once bicycle plans were something big cities did, small municipalities, such as the City of Leavenworth, are adopting their own bicycle master plans (City of Leavenworth, 2010). It is becoming increasingly important for small communities to take a local leadership role in shaping their non-motorized transportation futures.

Land Use and Transportation

A topic of interest for many researchers is the extent to which the characteristics of the urban environment contribute to bicycling behavior. Neighborhoods with higher densities, better connectivity, and mixed land uses have higher rates of active transportation (Saelens, et al., 2003). From bike lanes and nearby retail centers to on-street parking, numerous studies (Krizek & Johnson, 2006; Saelens, et al., 2003; Sener, et al., 2009) examine the value of these characteristics to cyclists. One study found that, in order for a bike lane's use to be statistically significant, it must be located 400 meters or less from the user's home (Krizek & Johnson, 2006, p. 39). The message is a simple one: build it and they will come. But build what, where, and for whom? Questions remain in many communities especially considering that studies cannot demonstrate a causal relationship between bike facilities and user turnout (Lund, 2003). We do not know if bicycle facilities attract non cyclists to begin cycling or if communities with bicycle facilities attract those who already cycle to live there. A recent study in Bogota, Colombia shows that what matters for increasing physical activity in this city with a diverse land use mix, is route connectivity and access to recreational cycling opportunities (Cervero, et al., 2009). Specifically, Bogota uses *Ciclovias* which are existing boulevards or streets around the city that are used only for walking and cycling on Sundays and holidays. Can the lessons learned from the developing city of Bogota be relevant for the City of Leavenworth which, for example, maintains a strong and compact grid street pattern? For small communities, these studies, which are undertaken in larger cities, often do not address how bicycling can be compatible with their own distinct urban characteristics of historic main streets, lower population and employment densities, and more suburban and rural landscapes.

Increasingly, planning and health professionals collaborate on research projects demonstrating the symbiotic relationship between the two fields in fostering active lifestyles (Dill, 2009; Frank, 2004; Moudon & Lee, 2003; Saelens, et al., 2003; Sallis, et. al, 2004). Using global positioning systems (GPS) with 166 cyclists in Portland, one researcher shows that adults making use of the city's cycle infrastructure can meet recommended daily physical activity levels (Dill, 2009). This presents a tremendous opportunity not just in larger cities but also in small towns. While the CDC reported that the most obese states are in the South, other communities should not ignore their own obesity rates. For example, in Leavenworth County thirty percent of adults are obese and twenty five percent of adults are physically inactive (Centers for Disease Control and Prevention, 2008). Using active transportation, even just a few extra minutes a week, can contribute a great deal to a person's physical activity level.

“Moderate-intensity physical activity acquired through more nonmotorized transport, undertaken by a large proportion of the population over time, would have significant public health impact. Indeed, walking or cycling for transport to work appears to be associated with lower body weight and less adult weight gain over time, independent of the effects on body weight of more vigorous physical activity. Especially in the current context of no apparent increase in adult physical activity...the potential to enhance physical activity in entire communities by 15 to 30 min per week should be taken seriously” (Saelens, et al., 2003, p. 86).

A study out of California (Orrick, et al., 2011) examined, through qualitative inquiry, how employers made their workplaces and buildings attractive for cyclists by investing in trip end facilities such as parking and showers in the building's design. These studies should be of

particular interest to the City of Leavenworth and the US Army since many soldiers have the potential of including daily physical fitness requirements by combining travel and exercise. However, even though the innovative approaches are worth noting, these types of studies are often dismissed in small town circles because cities like Portland, Seattle, Berkeley and San Francisco might as well be on another planet when it comes to benchmarking for many small communities.

The transportation literature, meanwhile, focuses more on how to integrate non-motorized modes into the existing mechanisms such as demand modeling, geographic information systems mapping, and incorporating bicycling into front-end transportation planning procedures. One peer-to-peer review conducted by the Federal Highway Administration in 2009, reveals the collaborative nature of overcoming barriers in non-motorized transportation planning. Different levels of government must meet the challenges of developing consistent frameworks for information sharing among state departments of transportation, metropolitan planning organizations, and local cities and counties. Increasingly, bicyclist advisory committees are also added to the transportation and political decision-making process. More and more, the public's input is sought and found useful in the planning process (Iacono, et al., 2010; Replogle, 1995; Turner, et al. 1997).

Another barrier for promoting bicycling, and a source of frustration for advocates, is the overwhelming lack of consistent data being collected with respect to bicyclists. For example, one study reviewed the current demand forecasting techniques of simple trip generation, facility locator, stand-alone sequential demand, and the four step model. It described the lack of data in this way: "Although the techniques are untested and could have large errors, they would

represent an improvement upon the existing lack of bicycle/pedestrian demand forecasting tools” (Turner, et al., 1997, p. i). After decades of studying cycling, there is still considerable debate of what bicycling data collection methodology should look like. Should cycling data be collected along the same lines as pedestrian and automobile travel or designed around bicycling as its own unique activity? Again, having a closer understanding of bicycling may prove instrumental in advancing bicycling as transportation.

Individual Choices

Bicycling was once an efficient and convenient means of transportation for the individual. And though for most of the 20th century, the automobile replaced the bicycle in terms of convenience, there are trends that suggest that bicycling is regaining its value. The literature from an economics point of view often compares and contrasts bicycling with automobile travel. That is, increasing bicycling depends somewhat on what communities do to decrease automobile trips (Noland & Kunreuther, 1995). On the individual level, people make choices based on opportunity cost. The more time a person spends driving, the less time they have to spend on exercise or recreation. This phenomenon presents yet another reason for cities to promote bicycling through a transportation lens because “the most effective environmental interventions will increase the costs of sedentary transportation [driving] while reducing the costs of active transportation [bicycling]” (Frank, 2004, 148).

One way that households have experienced an increase in driving costs comes as a result of long distance commutes. Transportation costs are consuming larger amounts of household budgets. In the Kansas City metropolitan area, households earning between \$20,000 and \$50,000 spend ten percent more on transportation than on housing, thirty-three and twenty-three

percent respectively (Lipman, 2006, 2). The Kansas City area has the second highest total average transportation costs for low- to moderate-income workers following Atlanta (Lipman, 2006, 4). Because real estate decisions often impact cities and individuals, numerous studies seek to find a connection between housing and access to transportation (Greer, 2000; National Association of Home Builders, 2010). Homeowners in one Nebraska study (Greer, 2000, p. 10) found it easier to sell their homes when there was a trail located nearby. Buyers also reported trail presence to be a positive factor. However, the literature does little to show how housing and transportation impact individuals' choices to bike to work. Little is known about what happens when people who bicycle to work relocate to new communities. Do they keep cycling? Does their desire to cycle affect their decisions of where to live or if they keep cycling? Studying a military population, who relocate often, can help shed some light on these questions.

CHAPTER 3: BICYCLING RESEARCH METHODS IN THE U.S.

A Century of Quantitative Methods

A review of the literature shows, largely, the heavy reliance on quantitative methods to learn about bicycling culture in the United States. This comes from an emulation in social science research of the way knowledge is created in the physical sciences (Flyvbjerg, 2001). The main method of obtaining input from the bicyclists is the survey. This presents a barrier for officials in small towns who want to learn about cyclists in their own areas. Smaller communities often do not achieve critical mass, and the numbers of cyclists are too few to meet statistical strength tests associated with sample size requirements. Flyvbjerg argues that to be taken seriously, social science must refocus research from the proving or disproving of hypotheses to the scrutiny of powerful examples and lessons to be drawn from these cases. “In post modern conceptions of social science, the goal of global generalization is replaced by a transferability of knowledge from one situation to another, taking into account the contextuality and heterogeneity of social knowledge” (Kvale & Brinkmann, 2009, p. 171). The evolution of social science research will impact how we study our world, bicycling, and the field of urban planning. Since the perfection of the bicycle in modernist times to the world we know today, we can trace how our views of knowledge creation have changed.

Modernism in urban planning was manifested in the elimination of slums in cities, housing mass production, highway building, urban renewal projects, and other movements based on speed, efficiency, and the scientific method. These practices became institutionalized in the United States, and we see the patterns evident in our landscapes still today. Post-modernism is the opposing reaction to Modernism and “has led to a re-evaluation of reason. Soldiers are now

taught to listen to their 'inner voice', as well as to their Officers; scientists are urged to be ethically responsible; green politicians speak of restraining economic growth" (Turner, 1996, p. 6). But like any equal and opposite reaction, post-modernism became an extreme of plurality. The desire for individual autonomy, wealth, and rejection of mass society can be seen in suburbia, travel by single occupant vehicle, rise of the private realm and overall societal fragmentation. Turner suggests that we are transitioning into a Post Post-modern world. "One where the 'Age of Synthesis' is a possibility. Coherent, beautiful, and functional environments are wonderful things, which can be produced in different ways" (Turner, 1996, p. 10). In case study research, we see that same shift occurring. "The goal is not to make the case study be all things to all people. The goal is to allow the study to be different things to different people" (Flyvbjerg, 2001, p. 238). The ability of different types of communities to draw unique conclusions and lessons from case studies will be valuable in the study and promotion of bicycling.

Point of Departure

Overall, studies on bicycling populations concentrate in larger metropolitan areas, university towns, or in places known for their sustainable practices. Presumably, these study locations tend to have infrastructure to support cycling--be that bicycle lanes on the roads or supportive community attitudes. Even so, these cities have still only achieved around a five percent bicycling share of commute trips (League of American Cyclists, 2011). It is no wonder that small towns are somewhat hesitant to explore making investments in promoting bicycling. I propose that there is something wrong with the way we have been studying our cycling populations. In a way, the bicycling movement may have been so eager to be accepted into the

larger scientific transportation community adopting the theories of other disciplines, that it overlooked the importance of creating its own narrative and body of knowledge. That is why the existing literature relies so heavily on counts of bicyclists, data from surveys, and information produced from mathematical models. The dependence on a single type of methodology is not, in itself, a bad thing. What I am proposing is that our interpretations of what it means to promote bicycling can be enhanced by seeking out a practical view of how cyclists negotiate their rides, their beliefs, their lives around bicycling. To find this view, I discovered that, as the researcher, I needed to find a way to get as close as possible to the phenomenon in question. This study is a departure and appears to be the first study involving cyclists in a military town and one in which in-depth interviews with cyclists are the primary data source. Fort Leavenworth and the areas surrounding are not known to be bicycle friendly. Yet people do cycle. How can this be?

CHAPTER 4: THE STUDY

Study Context

Fort Leavenworth is a US Army post or installation located in northeast Kansas and home to the U.S. Army Combined Arms Center and the Intermediate Level Education (ILE) course for Army Majors. It is a controlled access installation meaning it has three entry gates where visitors must present credentials or subject themselves to a search in order to enter the installation. Motorists, bicyclists, and pedestrians must all queue through the gates. The population of soldiers and families living on post is about 8,000 people while 1,600 live off post in surrounding communities mainly Leavenworth, Lansing, and the Kansas City Metropolitan Area (Fort Leavenworth, 2010). Each year, the installation enrolls two nine-month courses--one in December and one in August. As the operational demand for Majors increases throughout the Army, the ILE is experiencing a growth in their student population which includes people from all over the U.S. but also the world as many allied countries send officers to the school. One of the more obvious side effects of this growth is the rise of automobile traffic leading to long lines at the entrance gates and intense competition for limited parking spaces.

Fort Leavenworth is a little over 5,600 acres with the main post area comprising about 2 square miles. The post is made up of housing areas, commercial and retail space, office and barracks facilities, open space, training areas, and the Army schools. It runs like a town with its own police force, public works, and recreational facilities. ILE courses take place at the Lewis and Clark Center. Its proximity to on-post housing and the cities of Leavenworth and Lansing, seems to hint at the possibility of commuting to the post on a bicycle. Physical fitness is of

utmost importance among Soldiers², so the idea of combining a functional activity with a fitness one may be appealing. When I first arrived at Fort Leavenworth in January of 2009, I attended a newcomer orientation. During the presentation, the Garrison Commander, or mayoral equivalent of an Army installation, addressed the traffic situation in this manner. He said here on Fort Leavenworth, we do not have a traffic problem; we have a walking and cycling problem. In other words, there are not enough people using alternative modes of transportation. He went on to say that cycling is highly encouraged. An Army post, in effect, is constrained by a growth boundary and feels the stress of automobile demand exceeding the land resources within its ability to allocate.

There are also geopolitical problems associated with high automobile use on military installations. As we approach the peak oil point and the following shortage of cheap petroleum and increase in prices, it is not difficult to discern the role of international politics and the pressures it is likely to place on the nation's armed forces. According to a report by the US Army Corps of Engineers, "Oil wars are certainly not out of the question" (Westervelt & Fournier, 2005). Often the conflict between national security goals and the economic forces of oil consumption create tumultuous theater conditions for the military operating in oil-producing countries. It is becoming increasingly necessary that local Army installations develop strategies to lead the way in promoting a decrease in fuel consumption.

Along with the environmental and political concerns of high automobile usage, the health of the older Army population is at risk. A U.S. Army initiative, called the APFRI or Army Physical Fitness Research Institute, is dedicated to targeting executive level service members for

² The word "Soldier" is capitalized to be consistent with Army writing standards.

prevention and treatment in diet, exercise, and stress management. The APFRI describes the automobile-focused habits and lifestyle challenges to eating well and getting exercise.

“Commute times often exceed one hour during which time they are frequently tied up in heavy traffic, on the cell phone, using spare minutes to conduct business on the freeway while finishing the rest of their coffee...Executives often eat on the run or in the car, or have a big dinner late at home, usually food high in fat content” (Barko & Vaitkus, 2000, p.1).

Since they are field grade officers or part of the Army’s executive workforce, ILE students are actively sought to participate in APFRI. Where in many units, physical training is a requirement, it is a self-monitored expectation at the ILE, and one that, realistically, students may forego. As operational tempo increases for the Army as a whole, Soldiers are finding time for aerobic activity scarce. Multitasking is critical. Combining transportation with exercise presents an efficient alternative for the Army, the Fort Leavenworth community, and the individual.

Research Question

The guiding research question is “how do cyclists make cycling work?”. The answers will help us understand the choices, motivations, and behaviors of cyclists in a small military town. The answers are revealed by the cyclists themselves in their own words. Subquestions hone in on the answer to this main question and focus the data analysis. Since some start their journey off post, what are the riders’ experiences as they travel in the civilian community and transition onto the post? What routes do they take, and how do they choose these routes? How does cycling for transportation affect their lifestyle choices, like housing, if at all? And ultimately, for planners, we want to know what would improve their bicycling experience?

Another question comes from the literature. One study stated “[m]oving residences also provides another strategy for examining environmental impact on transport” (Saelens, et al., 2003, p. 86). Soldiers and their families move frequently to duty stations around the country and the world. They also were born and raised in communities from big cities to farms. I ask “what role, if any, does environment play in the individual’s cycling experience?”. And how did they make cycling work in other places or duty stations if at all? I wanted to uncover their bicycle-life journeys--their past adventures and how they currently negotiate cycling in this small town.

Methodology

When I first considered studying bicycle commuters, I admit my first inclination was that I would design the study to include a survey as the main instrument of data collection. I would select variables, use a stratified random sampling technique and conduct a statistical analysis using complex mathematical processes. In fact, I had designed a draft of this survey model as an assignment for an earlier quantitative methods course. I was not a great quantitative methods student, but I thought maybe a little more practice might help me. As I delved deeper into the topic, I learned that a quantitative approach, specifically the statistical survey, was virtually the only lens through which bicycle travel was being studied. Choosing Fort Leavenworth and the surrounding communities as the stage for my study led me to the realization that context should drive my decisions. I knew I was dealing with a very different scenario than most other studies conducted in larger cities, university communities, and areas known to be pro-environmental. Fort Leavenworth is a small military installation surrounded by small towns and rural communities like Leavenworth and Lansing, Kansas and Weston and Platte City, Missouri. It

makes sense that “small N”³ research is a good match for a small community. In Table 1, I summarize how my research topic would manifest itself in two different research perspectives.

Table 1. Comparison of Research Methodology

What Does <i>This</i> Look Like...	...in <i>This</i>?	
	Quantitative Research	Qualitative Research
<i>Knowledge Sought</i>	who, what, how many? prefigured	how, why? emergent
<i>Role of Theory</i>	testing explicit at the beginning	development built throughout the inquiry
<i>Technique</i>	survey answers “who, what, how many”	case study answers “how, why”
<i>Rigor</i>	resides in the instrument experimental control	resides in the investigator focus and adaptability
<i>Generalizability</i>	statistical samples represent population random selection	analytical cases are exemplars strategic choosing
<i>Role of Researcher</i>	attempts value neutrality hopes to achieve bias elimination	accepts value subjectivity bias explication
<i>Success</i>	meets statistical thresholds confidence testing	pattern matching theoretical propositions

Advancing and testing hypotheses is the hallmark of quantitative methods. “In qualitative study, inquirers state research questions, not objectives (i.e., specific goals for the research) or hypotheses (predictions that involve variables and statistical tests)” (Creswell, 2003, p. 105). In choosing a qualitative case study approach, I provide readers with theoretical propositions or a “theoretical orientation guiding the case study analysis...to focus attention on

³ In statistics, N refers to the sample size. Sometimes case study research is referred to as small N research because it involves few samples.

certain data and ignore other data” (Yin, 2009, p. 130). Using my research questions as a frame, the following are the guiding propositions.

Q1. How do these travelers make biking work for them?

P1. Cyclists commute by making decisions based on weather, route connectivity, time, and distance. In other words, they behave and make decisions in the same manner revealed by existing studies.

Q2. How does their environment influence cyclists’ decision and ability to cycle?

P2. Individuals will report varying experiences according to location with respect to the city or military base’s density, weather, active transportation facilities, and land use mix. These are common factors seen in the literature as impacting bicycling rates.

Case Study Design

Taking into consideration my research question of “how do these commuters make bicycling work”, I designed the study as a qualitative single case study. “Colloquially, a research design is a *logical plan for getting from here to there*, where *here* may be defined as the initial set of questions to be answered, and *there* is some set of conclusions (answers) about these questions” (Yin, 2009, p. 26). According to Yin, construct validity in a case study design deals with “identifying correct operational measures for the concepts being studied” (Yin, 2009, p. 41). I utilize multiple sources of evidence to approach data collection consistent with case study research. The main source I use is semi-structured interviews of the cyclists traveling to Fort Leavenworth. Additionally, a review of documents in the form of plans (comprehensive, land use, transportation, and bicycle) and policies (Fort Leavenworth Garrison Command) inform the

context of the study. The third source of evidence are my own direct observations of bicycle facilities and route features identified by the interviewees. “With data triangulation, the potential problems of construct validity also can be addressed because the multiple sources of evidence essentially provide multiple measures of the same phenomenon” (Yin, 2009, p. 116). Because I am drawing conclusions based on information about events that already happened (i.e., the cycling trip), Yin recommends pattern matching, a process linking empirical patterns with theoretical propositions, to maximize validity (Yin, 2009).

Another way I strengthen the validity of my study is to use key informants. I chose three people with extensive knowledge of the local bicycling culture (Marshall, 1996). I conducted interviews with these subject matter experts at the beginning of the study design process to inform the writing of my interview questions. Then, at the end, I asked these experts to review my case study draft. Flyvbjerg asserts that a successful case study is one in which the researcher has purposefully sought contact with the outside world specifically the context in which the study has occurred. “The researchers will consciously pose themselves to reactions from their surroundings--both positive and negative--and may derive benefit from the learning effect...” (Flyvbjerg, 2001, p. 132).

Additionally, I utilize a case study protocol that helped me to establish the link between the questions of my study and the questions I posed to the cyclists (see Appendix A). From this case study protocol, I developed my interview questions (see Appendix B). The interview questions are a conversational manifestation of my research questions (Yin, 2009). One way to draw out how a cyclist makes cycling work is to ask him to tell me more about how he became someone who bikes to work. Also, I want to know how a cyclist’s environment influences his

decision and ability to cycle, so I ask him about help he gets from his family, friends, or community. Kvale and Brinkmann (2009) suggest that the use of leading questions can help us ascertain both the reliability of the interviewee as well as the reliability of the interviewer and her design of the interview. “The decisive question is not whether to lead or not to lead, but where the interview questions lead, whether they lead to new, trustworthy, and worthwhile knowledge” (Kvale & Brinkmann, 2009, p. 173). By posing these questions in an open-ended manner, I am getting the cyclists to tell me their own stories.

In qualitative research, the ability to generalize to theory is important. Yin reminds us of the urban planning example of Jane Jacobs’ study of New York City. This serves as a model for my study. Her case study was not generalizable in the sense of applying the findings to another city. Rather, the findings applied to broader urban planning theories of neighborhood features and community. In my case study, I will be looking to draw out conclusions from the experiences of these cyclists that deal with the more widely held beliefs of how people cycle and what makes a community bicycle-friendly.

The Cyclists

The unit of analysis in the study is the individual cyclist. My goal was originally to recruit twenty cyclists riding from off post onto post. However, as I began to recruit study participants, I found I had suffered from what Flyvbjerg calls optimism bias (Flyvbjerg, 2001). That is, I thought there would be more cyclists coming through the gates than what I encountered. So I expanded the scope of my participant pool to include cyclists who travel to work from on the installation. I used three techniques to recruit cyclists. The first approach I took was to obtain permission from the post provost marshal, or police department, to spend

time at the three different access control points to Fort Leavenworth. The map in Figure 1 shows the access control points, or entry gates, and the times I was at those gates waiting for cyclists to come through.

Figure 1. Fort Leavenworth Entry Gates



Source: Google maps

I recruited two cyclists at the Grant Avenue Gate, two cyclists at the Sherman Avenue Gate, and two cyclists at the Hancock Avenue Gate. I also obtained permission from the Command and General Staff College to recruit cyclists at the Lewis and Clark Center. I recruited eleven cyclists there by waiting at the bicycle parking and approaching them as they parked their bikes. Four bicyclists were referred by snowball sampling technique. In other words, a cyclist would say to me “have you spoken to so and so? He bikes to work all the time”. That presented me with a total of twenty one possible interviewees. Overall, cyclists were mostly receptive to my presentation. Once they found out I am the spouse of a service member, they became more at ease about what I was asking of them. Seeing me as part of their community, it made my role

as an investigator non-threatening. Since my initial encounter with the cyclists I met in person was brief, I made a follow up phone call to discuss their participation in my study. I eliminated two because they informed me they cycle for sport and not to work. I dismissed another because he was a gate guard who self-reported that he cycled to work and that did not fit my sampling strategy of either witnessing a person cycling or receiving a referral from someone else. Others did not respond to my follow up calls or emails, so I took them off the list. That left me four cyclists from the gates, three from snowball sampling, and six from the Lewis and Clark Center. I decided to choose three from the Lewis and Clark Center to allow for an even mix of each sampling type. That gave me a total of ten interviews. Table 2 describes the cyclists I interviewed, how I recruited them, and how long I spent interviewing them.

Table 2. Description of Cyclists

Personality	Method of Recruitment	Description	Time	File #
<i>The Necessary Cyclist</i>	By researcher at Grant Ave. Gate 8 Nov at 1630 walking bike home	Lives in Leavenworth, KS. Divorced dad, father of three. Riding bike until he can afford a car. Has enjoyed a 40 lb. weight loss from biking.	1:03:20	1
<i>The Diligent Cyclist</i>	By researcher at Grant Ave. Gate 8 Nov at 0800 riding bike to ILE	Lives in Leavenworth, KS. Has also cycled in Alaska and Korea. *This was the case not recorded due to a technical mistake on my part.	N/A	2
<i>The European</i>	By researcher at Sherman Ave. Gate 12 Nov at 0803 riding bike to ILE	Lives the furthest away in Lansing, KS. An international military officer from Europe. About Kansas: "It's rather flat. But once you're on a bike, it's not flat"	55:57	3
<i>Closet Tree Hugger</i>	By researcher at Sherman Ave. Gate 12 Nov at 0750 riding bike to ILE	Lives in Leavenworth, KS. Rented apartment 1 mile away to ride to work. Has also cycled in Germany.	41:23	4
<i>Parking Lot Avoider</i>	By researcher at Lewis & Clark Center Bike Parking 19 Dec at 0743	Lives on Fort Leavenworth, KS. Has cycled recreationally before. This is the first place he had biked to work. Has no patience for the "parking situation" on post.	1:00:33	5

<i>Sidewalk Rider</i>	By researcher at Lewis & Clark Center Bike Parking 19 Dec at 0745	Lives on Fort Leavenworth, KS. Prefers to ride on the sidewalk not on the road. Household owns one car. Has also cycled in Pittsburgh and West Point.	45:17 6
<i>The Lifer</i>	By researcher at Lewis & Clark Center Bike Parking 19 Dec at 0746	Lives on Fort Leavenworth, KS. Has been biking “longer than you’ve been alive”. As a teenager was pinched on his spandex-covered bum by the head cheerleader; been riding since.	1:21:57 7
<i>Fair Weather Rider</i>	Snowball technique referred by “Diligent Cyclist”	Lives in Leavenworth, KS. Has also cycled in Italy. Rides if it’s “easy, pretty, and convenient”.	53:47 8
<i>High Road Rider</i>	Snowball technique referred by “Sidewalk Rider” and key informant	Lives in Leavenworth, KS. Has also cycled in Korea. Was convinced by his neighbor to ride to work. Knows the community well and is a bike advocate.	1:16:11 9
<i>The Militant</i>	Snowball technique referred by my husband; coworkers	Lives on Fort Leavenworth, KS. Loves to spend time building up his custom bike. Started cycling after bike tour on vacation in Hawaii.	1:34:16 10

The first column of Table 2 notes the nickname I gave them to represent their testimony in this study. This avoids portraying the cyclists as just another number and give you, the reader, someone to connect to. Although Yin professes that “anonymity is not to be considered a desirable choice” (Yin, 2009, p. 182), I used fictitious names because I was dealing with a sensitive population concerned with information security. In all cases, the fictitious name is a label or trait used by the cyclist to describe himself or his views on bicycling. I assigned the nicknames after most of the analysis was complete so as to not bias my interpretation of the data. Also in the table, I noted the amount of time the interview took. I listed the manner in which I recruited them as well as a brief description of their bicycle life-journey.

After I recruited the cyclists, I scheduled one hour interviews with them. I started the interview by asking them how they became someone who rides their bike to work and the history of how this came to be. They related how they get around in the community on a bike, the routes they take, how they choose those routes, and their feelings about the support they get to cycle.

The cyclists offered their advice and lessons learned to rookies and people trying bicycling to work for the first time. Lastly, I asked what they thought about factors commonly studied in bicycle planning as well as what they would do to make this area more bicycle friendly.

Data Analysis

All interviews took place at the Combined Arms Research Center Library and were recorded using Apple Garageband software. I transcribed the audio files, but only nine transcripts are available because I did not properly record one of the interviews. “The process of bringing, order, structure, and interpretation to a mass of collected data is messy, ambiguous, time-consuming, creative and fascinating. It does not proceed in a linear fashion; it is not neat” (Marshall & Rossman, 2006, p. 154). Yin (2009) recommends several strategies and techniques for rich analysis of case study data. The strategy that I employed is called pattern matching. I relied on the theoretical propositions to guide my analysis technique of pattern matching to know “what is worth analyzing and how it should be analyzed” (Yin, 2009, p. 162).

After becoming intimately acquainted with the audio of my interviews by listening to each twice, I then identified initial patterns and typologies of the participants’ responses. The goal in qualitative study is to “identif[y] the salient, grounded categories of meaning held by participants in the setting” (Marshall & Rossman, 2006, p. 159). In order to sort the transcript data, I tried and erred in multiple attempts at finding a rhythm and methodical process that would work for me. I used online tag-cloud generators⁴ to give me a snapshot of the most frequent words in a transcript. I printed the transcripts and cut them up into small pieces putting them into envelopes by theme. Although, at first, it seemed like a good strategy, this left me with

⁴ I used tagcrowd.com because it allowed me to exclude words like “bicycle”.

many envelopes and no way to make sense of their contents. I found it challenging and frustrating to figure out the best way to whittle down the large amounts of text to a usable format. Finally, I decided to color code the transcripts identifying the themes that emerged. After color coding the transcripts, I condensed each fifteen to twenty page coded transcript to a one page synopsis. This one page review represented the essence of the interview and made it possible to summarize and compare across cases. In the following section I have reported the results according to the themes I found most prevalent in the conversations with these cyclists.

CHAPTER 5: THE RESULTS

How Do They Make Cycling Work?

According to the literature, people make cycling work by making decisions that are influenced by the weather, the design of the roads, the density of their surroundings, and the availability of bicycle facilities. In most cases, the cyclists discussed themes consistent with those found in the literature even before I brought them up in the interview. With question number three (see Appendix B), I asked cyclists to weigh in on what they thought about some of the factors commonly studied in bicycling research. I asked their opinions about population density, the design of the roads, distance, and facilities for cyclists such as parking and showers. Cyclists reported that these factors mattered to them in different ways (see Figure 2 at the end of this chapter). Cyclists also mentioned topics that are not readily explored in the literature such as prior experience cycling in the U.S. and abroad, the lifestyle choices of cyclists, and common barriers they face.

Cyclists are not homogeneous in the ways they make biking work for them. Cycling happens as a result of a combination of both internal and external forces. Internally, individual commitment levels vary. Each cyclist has a different personal distance threshold; that is, they all have a different limit as to how far they can or will go before biking to work is not feasible. Externally, cyclists are influenced by people in positive and negative ways. Family, friends, and other cyclists can be a motivating factor for these cyclists. Conversely, negative perceptions from people who don't cycle or a sense that the community does not support cycling also impacts how cyclists bike to work and how they see themselves as cyclists.

Nomadic Cycling

When I asked the bicyclists to take me through the history of how they became someone who bikes to work, they responded by first telling me about their cycling experiences as children. Cyclists grew up in places like South Florida, New Jersey, Kansas, Central Illinois, and near Camp David in Maryland. Several talked about their university days and bicycling around campus or as kids to school and on paper routes. Six cyclists mentioned commuting at previous duty stations within the continental United States (CONUS) and six cyclists described their experiences riding to work outside the continental U.S. (OCONUS). They cycled in Italy, Alaska, Germany, and Belgium. For some, riding in other countries introduced them to environments that are conducive to cycling and played a role in their picking up bicycling either for recreation or for commuting. They cited the availability of bicycle paths, the fact that it is socially acceptable and common for people to cycle, and how the government incentivizes cycling. *The European* discussed his own country's efforts to promote cycling by paying citizens twenty euro cents per kilometer to cycle or about fifty dollar cents per mile. Those with experience cycling abroad thought it was safer and more convenient. According to them, this is due to the awareness drivers have of cyclists, well-maintained road and bike path systems, cultural differences, and the "nature of how things were laid out" (*Closet Tree Hugger*).

Nine cyclists reported having prior experience cycling for recreation either touring or racing. For *Parking Lot Avoider*, riding to work at Fort Leavenworth is his first experience biking to work. For him the parking problem at Fort Leavenworth played a big role in his decision. He cycled for sport, prior to coming to Fort Leavenworth, and his wife had encouraged him to commute at their last duty station. He knew about the parking shortage even before he

moved to Fort Leavenworth. *Parking Lot Avoider* was not the only one to mention the “the parking problem”. I did ask specifically about it, but, nonetheless, four cyclists discussed it as being a factor they considered when deciding to bike to work. Many felt they saved time biking to and leaving the Lewis and Clark Center.

You have to drive with your car and then you have to walk to the building. By the time I change myself, get on my bike at the building...At the same time I am at the gate, I always see the people that have to walk to their car, take their car, and then drive to the gate. But at the same time, I am on my bike, and we arrive at the same time at the gate. (*The European*)

Cyclists living on post felt it was easier and faster to ride to work than to drive and walk the long distances from the parking lots to their places of duty. This is easily witnessed at the Lewis and Clark Center where long lines of cars can be seen queueing and competing for parking spaces. Conversely, the bicycle parking is located right outside of the entry doors on the south side of the building. Even though cyclists described the parking problem with a sense of frustration, they also felt satisfaction in knowing they circumvented the problem. “It’s easier to find parking for a bicycle than it is for a car” (*The Lifer*). These conveniences associated with bicycling kept them riding to work.

Lifestyles of the Near and Cycling

Adding to the convenience factor, cyclists tended to live either on the installation or rather close. Four (*Parking Lot Avoider*, *Sidewalk Rider*, *The Lifer*, and *The Militant*) live on post, and five (*The Necessary Cyclist*, *The Diligent Cyclist*, *Closet Tree Hugger*, *Fair Weather Cyclist*, and *the High Road Rider*) live in the City of Leavenworth, Kansas. The cyclist whose address was the furthest is *The European* who rides about six miles each way to the Lewis and Clark Center from his home in Lansing, Kansas. This commute, however, is shorter for him than

the one back home. He and three other cyclists even chose where they were going to live based on the desire to be able to bike to work.

That was one of the primary considerations. I knew the lady that rented it before me and she rode her bike I want to say, periodically, in the warm weather. And then when I was looking for apartments, and I knew her, I was like ‘that’s perfect!’”. A mile. That’s ideal. That’s one of the primary reasons I wanted to live there. So I can ride. (*Closet Tree Hugger*)

For others, even though they felt strongly committed to cycling, it did not always play an important role in house hunting.

In the house that we bought in Colorado, cycling wasn’t even factored into it. That wasn’t part of the equation. It was looking at the neighborhood. Looking at schools. So there was all those other lists of things of finding a neighborhood. And cycling, the ability to commute, wasn’t even part of that. (*The Lifer*).

When I asked about how they decided on their routes, the cyclists revealed that trial and error is a way they tested out various routes. Cyclists, for the most part, want the most direct route with minimal car traffic and the least amount of hills. As one cyclist put it, this is “not a sightseeing tour” (*Sidewalk Rider*). But the sights and sounds did not escape them. I asked cyclists to describe their sensory experience on their way to and from work. Most cyclists were in tune with their surroundings and reported smelling everything from car exhaust and rotting leaves to honeysuckle and the aroma of a first batch of early morning croissants from the bakery. Several cyclists described scenic elements they particularly enjoyed like the sun setting over the river bluffs and regular people they passed on their rides. The cyclists are alert and attuned to their surroundings.

Like being out and feeling the wind, and feeling the temperature, you know. People look at me like I’m crazy when I’m out riding and it’s freezing out. I mean, literally, below thirty-two

degrees. And it's hard to explain that once you get pedaling, that sharp cold air and the way it feels in the back of your throat and the way it kind of nips at your skin as you're going...It's exhilarating. You feel alive....There's the smells, the sounds, and you don't get any of the that in a car...I don't so much like the dead skunk smell. (*The Militant*)

They take it all in. The good with the bad.

Cyclists admit they lose a level of personal freedom they have with driving a car. Biking to work means being very proactive and organized. The cyclists talked about the logistical arrangements they plan ahead to make cycling work for them. Planning to bring everything with them for the day. Planning for any side trip to the gym or commissary for groceries. Planning for picking up children and coordinating with spouses for vehicle use. Planning for bad weather and flat tires. "You actually have to structure your day a little differently with the understanding that it's not as fast or convenient if you're gonna ride your bike" (*Closet Tree Hugger*). Prior planning was an overarching theme among cyclists in making biking work for them.

Some talked about how their roles as students at Fort Leavenworth made it easier to bike. They bike to work, remain at the Lewis and Clark Center for most of the day, and then bike back home. Whereas when they worked in a traditional unit setting, they revealed difficulties in being able to cycle because the job duties required them to make various trips throughout the day. Trips, they felt, were unmanageable on a bike.

Six of the cyclists I interviewed either shower or change after riding once they get to work. *The Lifer* recounted his experience biking in Denver, Colorado where his commute was thirteen miles each way. He commuted the first four days of the week by bicycle and used Fridays to drive his car. He would take his uniforms to work to prepare for the next week's commute and bring home dirty laundry from the office. *The European* and the *High Road Rider*,

both experienced cyclists, also talked about how they pre-stage clothing for the week. Having an office is helpful since cyclists can put in a small locker, clothing rack, or laundry bag to collect clothes. Students at school at the Lewis and Clark Center have lockers, but they are not ventilated which is desirable since riding clothes can become wet and stinky. They can also carry their dirty clothes in a bag on their person or take them to class. But fellow students may not appreciate this much.

Support? What Support?

When asked about what kind of support they receive from family, friends, and the community, cyclists mostly reported that they make cycling work on their own with little or no support. Only four cited support from family and friends, and it was in the form of a ride home in the event of bad weather or mechanical problems. One cyclist, *High Road Rider*, told me a very close family member is just as avid a bike commuter as he is, and that they support each other. He was also the only one to express he felt community support. From our conversation, *High Road Rider* also seemed to be the one most involved in bicycle advocacy. He talked about having a rapport with some of the post and city officials and feeling comfortable discussing the needs of cyclists with them.

Although only four cyclists explicitly identified family and peers as “support”, it came across in all interviews. Half of the cyclists mentioned growing up with a family member who cycled or played a role in their learning to ride a bike. In fact, they reminisced, fondly, and told me stories about these relatives.

My grandfather actually took me to the top of the hill, put me on a bike, and sent me to the bottom...pick up enough momentum, I guess you start to figure it out. (*Sidewalk Rider*)

We always had bikes and we would go out riding a lot. And my dad used to get a lot of DUIs and whatnot, so he would be deprived of a license, and he would get on a bicycle. And I lived with him, and we would go riding around together a lot. Like, a lot, a lot. (*The Necessary Cyclist*)

During the oil crisis in 1973 when prices were ridiculous and availability was worse, my dad, who was not at all athletic...I mean, he literally was a clerk....he took typing in high school as opposed to sports...He started riding a three speed bicycle back and forth to work. And he worked in the city, so it was a fairly urban ride, and it was an unusual thing to do back in the '70s particularly for a guy who was going on fifty years old. But he just did it, absolutely matter-of-factly...never asked for any special recognition or anything. (*High Road Rider*)

Another type of social support came from peers. Six cyclists specifically indicated being connected to the Sante Fe Bicycle Shop in Leavenworth. They spoke highly and warmly about the proprietor as well as the recreational riding groups sponsored by the shop. *The Necessary Cyclist*, who bought an inexpensive bike at Wal-mart remembered when he suddenly found himself in need of a repair.

The pedal broke on my bike one day. There is a bicycle shop right downtown [Leavenworth]. It broke about a mile from downtown. I went in there and the guy fixed it in, like, five minutes, and it was, like, five dollars. So that was heaven sent. That was so awesome. (*The Necessary Cyclist*)

Cyclists also discussed neighbors. For *High Road Rider*, neighbors had a hand in convincing him to bike to work. *The Lifer*, on the other hand, had successfully convinced a couple of neighbors to bike with him on occasion. To understand how cyclists feel perceived among their peers, I asked cyclists to tell me “what do other people think about you as someone who rides their bike to work?”. Responses varied from thinking cyclists are crazy, to being interested in how they do it, and to not caring one way or the other. However, contrary to their views about receiving little support from the community, cyclists communicated being pleased with such

amenities as the abundance of bicycle parking at the Lewis and Clark Center. Several cyclists reported using shower facilities, although limited, at the Lewis and Clark Center and nearby gyms on post. Many cyclists noted the inherent features of a military installation that make it easier for them to cycle. These included the lower driving speeds of motorists, increased police enforcement of driving infractions, and availability of showers and bike parking at work places, gyms, and other destinations around post.

Two Words. Grant. Avenue.

The one issue that cyclists were eager to bring to my attention is the post's restriction that bicyclists cannot ride on the road on Grant Avenue. The main two lane road on Fort Leavenworth carries a large part of the post's vehicular traffic volume during peak commute times. Cyclists are prohibited from riding on Grant Avenue, so they must either ride on the sidewalk or choose a different route. Biking on the sidewalk is allowed and encouraged on Fort Leavenworth. Knowing about these rules from key informants, I suspected that cyclists would have something to say about it in the interviews, and they did. Cyclists who preferred to ride on the streets were not pleased, insulted, and even angered by this rule.

The worst part is you get to the [post], and it's got this great corridor for coming up on it, and it should be really beautiful and really manageable. But they have this fierce anti-bike stance where they say bicyclists are not allowed to ride on the street. But that, to me, that irks me more than anything else. (*Fair Weather Rider*).

Cyclists felt that this was an arbitrary rule that made no sense and made the sidewalks dangerous for pedestrians. They felt the sidewalk did not offer a practical alternative on Grant Avenue especially because of bollards located in the middle of narrow sidewalks, cracks and unevenness

in the sidewalk plates, and ninety degree turns in the sidewalk path. However, cyclists understand the policy attempts to address both cyclist and motorist safety and comfort.

I've had discussions with [an official] on post...and we've gone back and forth about whether or not it's prudent, given the situation as it is, whether or not it's prudent to ride a bike on Grant Avenue. And honestly, I tend to agree with him. It's probably not safe to ride on Grant Avenue. I know people panic because they think those lanes are way too narrow. And put a bike in there, not a good mix. So as much as I hate riding on sidewalks, that's what I have to do on Grant.

(High Road Rider)

Cyclists who prefer the street often used the Sherman Avenue gate, but this presented problems, too, because the gate is only open during peak commute times and closed most of the day.

However, *Sidewalk Rider* and *The Necessary Cyclist* prefer to ride on the sidewalks because they feel safer and do not want to compete with cars for space and interfere with drivers on the road. Sidewalk Rider stated, "If I was allowed to ride on it, I wouldn't anyhow just because of the amount of traffic".

Key Findings

These ten cyclists utilize a blend of strategies to make biking work for them. Figure 4 describes, briefly, some of the topics covered in the interviews. Overall, cyclists had similar positive past cycling experiences having biked as kids or for sport and recreation. They had a mix of experience commuting in the United States and abroad. Social support systems, like family, peers and community, play a role in the cyclists' riding decision-making process even though they may not clearly identify them. And lastly, amenities at the work site, like bike parking, lockers, and shower facilities are highly valued by cyclists.

Figure 2. Key Findings Comparison

	1-The Necessary Cyclist	2-The Diligent Cyclist	3-The European	4-Closest Tree Hugger	5-Parking Lot Avoider	6-Sidewalk Rider	7-The Lifer	8-Fair Weather Rider	9-High Road Rider	10-The Militant
Cycling Experience										
in youth	x	x	x	x	x	x	x	x	x	x
parent influenced	x	x	x	x	x	x	x	x	x	x
family bikes		x	x	x	x	x	x	x	x	x
prior CONUS commute	x	x	x	x	x	x	x	x	x	x
prior OCONUS commute	x	x	x	x	x	x	x	x	x	x
prior sport/recreational	x	x	x	x	x	x	x	x	x	x
Help and Support										
from family	x			x		x		x		
from community								x		
others think...	it's cool	--	it's crazy	don't care	it's crazy	don't care	it's nutty	--	it's crazy	it's nerdy
Lifestyle Choices										
influence housing	x	x	x	x	x	x	x			
family accommodates	x	x	x	x	x	x	x			
Trip Choices										
rides on the...	ST+SW	ST	ST	ST+SW	ST	SW	ST+SW	ST	ST	ST
showers/changes	x	x	x	x	x	x	x	x	x	x
route decision	T&E	Direct	T&E	Direct	Direct	Direct	Direct	low traffic	T&E	long+hills
weather matters	x		x	x	x	x	x	x	x	
population density matters			x	x	x	x	x	x	x	x
design of roads matters	x	x	x	x	x	x	x	x	x	x
distance matters		x	x	x	x	x	x	x	x	x
bike facilities matter		x		x	x	x	x	x	x	
They Also Mentioned...										
bike shop	x	x	x	x	x			x		
parking problem			x	x	x	x				
post restrictions	x	x	x	x	x	x	x	x	x	
example for kids	x		x	x	x	x	x			
grocery store	x		x	x	x	x	x	x	x	
type of bike	mountain	road	road	mountain	mountain	mountain	road	touring	road	road

Note: x=the cyclist possessed this feature or discussed it; ST=street; SW=sidewalk; T&E=trial and error; CONUS=continental United States; OCONUS=outside the continental United States

Cyclists' Words of Wisdom

I posed two scenarios to the cyclists. First, I asked them to imagine I was a colleague of theirs interested in biking to work. I asked them “what advice would you give me to make it work?”. Cyclists had both strategic and philosophical advice for people who want to give cycling a go. Practical advice included buying the right kind of bicycle, equipment, and gear. Selecting the right bicycle is a matter of individual preference, financial situation, and experience level. Those traveling furthest and with more experience rode road bikes. For others, mountain bikes were best for riding on the street and bumpy sidewalks. Cyclists also recommended testing routes. These dry runs should be conducted on a weekend not on a day when something important might be happening at work. If you can, cyclists say take a day of the week, like Friday, to pre-position clothing and other items you don’t want to carry on a bike. *Parking Lot Avoider* overcomes weather by riding in his Army gear which includes wet and cold weather protection items. *The Lifer* agrees that those interested in biking to work should not let weather deter them, using fenders and starting in spring and summer might help with that. But riding in the rain is not for everyone. *The Necessary Cyclist* advises “if it rains, then that’s it...game over, and you need to get a ride”. Other gear that was useful, and sometimes required, included gloves, helmet, lights for seeing and lights to be seen. Cyclists talked about some common misconceptions and stigmas associated with bicycling. They talked about the role of overcoming negative peer pressure and having self-confidence.

A few people have seen me ride my bike or whatever, so they know that I’m doing it for the most part. Sometimes that’s a little bit embarrassing, because it’s not about not being able to buy a vehicle, it’s just making the choice not to. (*Sidewalk Rider*)

I don't feel compelled to be known as the guy with that vehicle. You know? I'd rather just as soon be known as the guy who rides his bike, and that's different. I don't know if it's better or worse; it's different. So don't be ashamed to ride a bike to work. (*High Road Rider*)

The best “gear” you can have, as someone learning to bike to work, is a friend. The Army uses the buddy system as a foundation for training and even in combat, so it's no wonder that many of these cyclists are connected, in various ways, to other cyclists, and are often helping others learn to ride whether for fun or to work. Cyclists felt it was important to stress the convenience of riding a bike especially in this small military town.

The last scenario I posed to riders is to imagine that we want their input to make this community bicycle friendly. When cyclists discussed their recommendations, most commented on three things. The first is dedicated roadway space for bicycles. Cyclists felt that having wide shoulders would allow them the necessary space to travel on the street with traffic. Riding on sidewalks or bike lanes presents pedestrian safety problems and maintenance issues. Cyclists do not feel confident that these options will be cleared of snow in the winter, for example. But this does not mean they do not value the option for inexperienced cyclists to ride on the sidewalks or separate facilities like bike lanes. Cyclists recognize that people feel safe using these sidewalks and bike lanes.

People see bike lanes and they feel safe to ride their bicycle and it gets them out riding...I'm a big proponent of any piece of urban infrastructure that would get people, that would encourage them to use that mode of transportation. (*The Militant*)

This presents a catch-22 situation. If cyclists are not allowed on streets and forced to ride on sidewalks, then motorists will develop the expectation that cyclists are not on the road. When, in actuality, cyclists being required to ride off the street is the exception not the rule. This change in

driver expectation can lead to even less awareness of bicyclists by drivers. Driver awareness is very valuable to cyclists, and policies which contribute to minimizing that awareness tend to be rejected by bicyclists.

Aside from roadway improvements and policy changes, trip end facilities are also key to cyclists' ability to function on a daily basis. The facilities they mentioned as helping them include bike parking, locker space, shower facilities, and space to attend to personal hygiene. While the Lewis and Clark Center provides plenty of bicycle parking and some shower facilities, not all work places on post and in the civilian communities do. As new improvements are made to the community, cyclists would like to see the upgrades address the needs of bicyclists. "When new buildings are constructed, that needs to be taken into consideration. That you need to have a shower facility for x number of employees" (*The Lifer*). One cyclist talked about how he requested his supervisor to install a bike rack. He did, and the cyclist felt supported by his Chain of Command as a result.

CHAPTER 6: DISCUSSION AND CONCLUSION

Discussion

The cyclists discussed themes common in the literature which also manifest in their own bicycle life-journeys. Issues such as the health benefits of cycling, personal distance thresholds, negotiating weather conditions and the environmental aspects of cycling. The cyclists also touched on surprising topics worth noting. Social support systems, like family, peers, and community have played a role in helping the cyclists bike to work. On the one hand, it was disheartening that the cyclists did not claim community support, outright; but, on the other hand, it is promising that they did name many of the community's features as valuable in their bicycling lives. Also unexpected was how valuable trip end facilities are to this group of mostly experienced cyclists. They tended to favor these more than road improvements. I wonder if cyclists with little experience would feel the same way. Also noteworthy is the mix of previous experience these cyclists bring to the table. All cyclists reported having cycled as children. Although I know firsthand how much traveling one does as a military family, I was not expecting to find a group of people who have *cycled* all over the United States and the world. Exposure to these places is important in how bicyclists view Fort Leavenworth and surrounding communities in relation to other places they have cycled. Cyclists also transplant strategies and bring ideas of best practices as well as expectations with them from these travels.

Unfortunately, the number of people bicycling for transportation in small towns is often too low to convince leaders to invest in promoting bicycling. However as many of the cyclists noted, small communities, including the cities of Leavenworth and Lansing, have many desirable ingredients for potentially becoming bicycle friendly. People living and working in these

communities enjoy features like lower speed limits and traffic volumes, proximity between destinations, and the connectivity of grid street patterns. For small communities interested in promoting bicycling for transportation, the focus should not be on the numbers of people who cycle or do not cycle. The heart of the matter, instead, for small communities, should be to gain a better understanding of the people in the community who already do bike to work or school.

Through interviews and focus groups, knowledge can be obtained on how cyclists deal with barriers in the environment, how they use the facilities that do exist, and the strategies they have in place for making biking work for them. But more importantly, this gets a conversation going between the local government and cyclists. A conversation not based on tokenistic efforts of surveying but on real dialogue and listening. This insider information can then be used to better inform public policy decisions using cycling data that is relevant because it comes from within the community.

For example, this small group of cyclists commuting in and around Fort Leavenworth relies a great deal on trip end facilities than they do on non-existent road features such as bike lanes. Bicyclists, for the most part, felt the roads on the post and in the surrounding communities were just fine for riding. However, they could use some help when it comes to the “transition time”, as one cyclist put it, in between riding and starting the work day. This transition time includes finding a place to secure your bike and attend to personal hygiene. For cyclists, working out the logistics of riding with cargo, changing clothes, and storing personal items can become a barrier if not overcome. This suggests that exploring cycling to work from an employer point of view may be quite productive in places where cycling numbers are too low for funding road infrastructure improvements. Employers, both public and private, have the power

to incentivize biking to work by adding shower facilities, participating in tax benefit programs, providing ventilated lockers, and installing bike parking.

As an employer, Fort Leavenworth, other military installations, and the Department of the Army have the opportunity to promote bicycling at a scale previously unseen in the United States. The Army, too, has the ingredients to successfully promote bicycling for transportation. The first of those is the hierarchical nature of the organization. The Chain of Command, as it is called, allows for quick and systematic changes to take place. The post Garrison Commander, or mayoral equivalent, has a special authoritarian and motivating role in how bicycle friendly a military post becomes. Another favorable feature is the master planning process used for military installations. This process should take into account and provide for the needs of service members who bike to work. At Fort Leavenworth, and other posts targeted by the APFRI program, combining physical fitness and transportation should be evaluated as a serious way to maintain the health of the fighting force and address ever-growing traffic problems on military installations. One way to promote this would be to limit the availability of parking on the installation. Four cyclists cited the parking problem as a motivating factor in their decision to ride a bike to work. This illustrates how bicycling, in these cases, becomes more convenient than driving. Because of the transient nature of military life and the eventual retirement and settlement of Soldiers in communities across the country, it is possible that lifestyle changes adopted by these service members could spillover into civilian communities.

Limitations and Future Research

The study has some limitations. The results are gathered from a small group of male interviewees affiliated with the military either as service members or civilian employees. Additionally, most participants were white between the ages of thirty three and fifty one. The interpretations offered here are mine alone. The results are characteristic of the cases in this study but probably will not be generalizable to all cases everywhere. If I could do the study again, I would conduct the study as part of a team of two or three researchers in order to collect different interpretations of the data from the interviews. I would also test my interview instrument more than twice which is what I did. What I think I have done well as a researcher is to leave a detailed archive of this study for anyone wishing to review my methods and interpretations. My study was not about control, but really the opposite. Giving up my control as a researcher to the cases I studied. Letting the cyclists tell me about what I thought I knew and then some.

The cyclists in this study revealed how they structure their everyday lives to plan and prepare to bike to work. Further research on bicyclists in small towns should be expanded to study, more in depth, the lifestyle choices made to support bicycling for transportation. Individual's decisions on where to live, how many vehicles to own, what type of gear to use, and the pickup and delivery of children all have an impact on how the cyclists go about the day. Decisions made by the community and employers such as putting in bike parking and showers, adapting work tasks to fit patterns of cycling, and policy choices also erect or remove barriers for the cyclist. Expanding studies to include a more diverse interviewee pool would reveal other types of struggles and successes for cyclists.

Another opportunity for future research would be to study, over an extended period, how service members, of all branches of the Department of Defense, continue to bike to work after each permanent change of station across multiple duty stations. Future studies would include other military installations. Comparison studies can be conducted on the bicycling culture of training-focused versus combat-focused units. As these people move around the country and around the world, what would their circumstances reveal about community support for cycling? It might also be revelatory to target more bicyclists who are biking to work for the first time. An ideal future study would be a design ethnography to delve deep into the lives of cyclists and truly understand how they make biking work by using the resources available to them. Lessons learned from these studies would inform the design of both the built environment and policy to support bicycling for transportation.

Conclusion

I want the reader to take away two things from this modest research. The first is the design of the study as a potential tool for learning more about what cyclists in your communities experience. For learning *how* they make it work. The interview questions I developed are open and malleable enough to present to cyclists in many scenarios. Case study methodology is just as valuable as the scientific method, and is equally as useful to people in practice especially in small city planning. Local government leaders in small towns often know the people who bike to work in their communities and may already seek bicyclists' input through participation in advisory committees. The second takeaway point is the premise that these common themes revealed may resonate with other cyclists and people interested in biking to work. They offer not the rule based knowledge of proving and disproving theories; just the everyday wisdom of what

it means to make choices and overcome challenges in the context of bicycling to work.

Bicycling does not have to be a subculture and something only strange people in tight clothing do in the United States. It is a behavior that takes both individual commitment and community support to encourage. Both are the chicken *and* the egg at the same time. Small towns and military installations can involve cyclists, at various experience levels, in the problem solving process to understand the trickle down effects of decisions beforehand. Communities should expand the definition of bicycle facilities to include, not just roads and signs, but also trip end facilities located at work sites like bike parking and showers. Cyclists-to-be can become successful commuters by finding a riding buddy with more experience. Communities can promote support systems by focusing on safe routes for children to lay the foundation for positive cycling experiences early on in life. For adults who want to give cycling a go, the community can be supportive by promoting recreational cycling, perhaps through *Ciclovias*, and by helping new cyclists network. Buddy systems, similar to ride share programs, can provide a low-cost option for matching novice riders with seasoned cyclists again to make sure first attempts are enjoyable ones. This isn't something you try nilly willy, and having a mentor or coach can really help build those habitual and long lasting behaviors to help you stick with it.

REFERENCES

- 23 USC 217. 2009. "Other Highways". Available at <http://uscode.house.gov/download/pls/23C2.txt>.
- Aultman-Hall, L., Damon L., & Lambert, R.R. (2009). Assessing the impact of weather and season on pedestrian traffic volumes. *Transportation Research Record: Journal of the Transportation Research Board*, 2140, 35-43.
- Babbie, E. (2002). *The Basics of Social Research*. Belmont, CA: Wadsworth/Thomson Learning.
- Barko, W.F., & Vaitkus, M.A. (Eds.). (2000). The U.S. Army War College and the road to executive health and fitness. US Army Physical Fitness Research Institute.
- Centers for Disease Control and Prevention (CDC): National Diabetes Surveillance System. Retrieved on 22 July 2010 at <http://apps.nccd.cdc.gov/DDTSTRS/default.aspx>.
- Cervero, R., Adkins, A. & Sullivan, C. (2009). Are TODs over-parked?. Research Paper No. 882. University of California Transportation Center, UC Berkeley.
- Cervero, R., Sarmiento, O.L., Jacoby, E., Gomez, L.F., & Neiman, A. (2009). Influences of built environments on walking and cycling: lessons from Bogotá. *International Journal of Sustainable Transportation*. 3:4, 203-226.
- City of Boston. (2011). Retrieved on 17 May 2011 at <http://www.cityofboston.gov/bikes/>.
- City of Copenhagen. Cycle Policy 2002-2012. Retrieved at <http://www.kk.dk/sitecore/content/Subsites/CityOfCopenhagen/SubsiteFrontpage/LivingInCopenhagen/CityAndTraffic/CityOfCyclists/CopenhagenCyclePolicy.aspx>.
- City of Leavenworth. (2010). "City-wide Trail Master Plan". Retrieved on 17 May 2011 at <http://www.lvks.org/egov/apps/document/center.egov>.
- City of Omaha. Retrieved on 17 May 2011 at <http://www.cityofomaha.org/mayor/mayors-office-home/archives/1266>
- Clifton, K.J., & Handy, S.L. (2001). "Qualitative methods in travel behaviour research. Prepared for the International Conference on Transport Survey Quality and Innovation Kruger National Park, South Africa.
- Creswell, J. (2003). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. 2nd ed. University of Nebraska, Lincoln: Sage Publications.

- Dill, J., & Carr, T. (2003). Bicycle commuting and facilities in major U.S. cities: If you build them, commuters will use them – another look. *Transportation Research Board*. Annual Meeting.
- Dill, J. (2009). Bicycling for transportation and health: The role of infrastructure. *Journal of Public Health Policy*, 30, pp. 95-110. Portland State University.
- Federal Highway Administration (FHWA). (2008). The bicycle revolution. Retrieved at <http://www.fhwa.dot.gov/infrastructure/bicycle.cfm>.
- Flyvbjerg, B. (2001). *Making Social Science Matter: Why Social Inquiry Fails and How It Can Succeed Again*. University of Cambridge Press.
- Flyvbjerg, B. (2006). "Five Misunderstandings About Case Study Research". *Qualitative Inquiry*, 12, 219-245.
- Fort Leavenworth Garrison Command. Public Affairs Office Post Statistics, 30 September 2010. Retrieved at http://garrison.leavenworth.army.mil/sites/installation/pao_help.asp
- Frank, L.D. (2004). Economic determinants of urban form: Resulting trade-offs between active and sedentary forms of travel". *American Journal of Preventive Medicine*. 27, 146-153.
- Gotschi, T., & Mills, K. (2008). Active Transportation for America. Rails to Trails Conservancy.
- Greer, D.L. (2000). Omaha recreational trails: Their effect on property values and public safety. University of Nebraska at Omaha.
- Handy, S., & McCann, B. (2011). "The regional response to federal funding for bicycle and pedestrian projects. *Journal of the American Planning Association*, 77, 1, 23-38.
- Herlihy, D.V. (2004). *Bicycle: The History*. Yale University Press.
- Iacono, M., Krizek, K.J., El-Geneidy, A. (2010). Measuring non-motorized accessibility: Issues, alternatives, and execution. *Journal of Transport Geography*, 18, 133-140.
- Krizek, K.J., & Johnson, P.J. (2006). Proximity to trails and retail: Effects on urban cycling and walking. *Journal of the American Planning Association*, 72, 33-42.
- Kvale, S. & Brinkmann, S. (2009). *InterViews: Learning the Craft of Qualitative Research Interviewing*. 2nd ed. Sage Publications. Thousand Oaks, California.
- League of American Bicyclists. (2011). Retrieved on 17 May 2011 at <http://www.bikeleague.org/resources/reports/>.

- Lipman, B. (2006). A heavy load: The combined housing and transportation burdens of working families. Center for Housing Policy.
- Lund, Hollie. 2003. "Testing the Claims of New Urbanism." *Journal of the American Planning Association*, 69, 4, 414-429.
- Marshall, C., & Rossman, G.B. (2006). *Designing Qualitative Research*. 4th ed. Sage Publications, California.
- Marshall, M.N. (1996). "The key informant techniques. *Family Practice*, 13, 1, 92-97.
- Moudon, An.V., & Lee, C. (2003). "Walking and bicycling: An evaluation of environmental audit instruments. *American Journal of Health Promotion*, 18, 21-37.
- National Association of Home Builders (NAHB). (2010). Research on factors relating to density and climate change". Abt Associates, Cambridge, Massachussetts.
- Noland, R.B., & Kunreuther, H. (1995). Short-run and long-run policies for increasing bicycle transportation for daily commuter trips. *Transport Policy*, 2, 1, 67-79.
- Orrick, P., Frick, K.T., Ragland, D.R. (2011). Bicycle infrastructure that extends beyond the door: Examining investments in bicycle-oriented design through a qualitative survey of commercial building owners and tenants. Faculty Research. University of California Transportation Center, UC Berkeley.
- Pedestrian and Bicycle Information Center (PBIC). (2011). Retrieved on 30 May 2011 at <http://www.walkinginfo.org/faqs/answer.cfm?id=3308>.
- Plater-Zyberk, Elizabeth. (2010). Lecture. Galloway Lecture Series. University of Kansas. Lawrence, KS. September 9, 2010.
- Replogle, Michael. (1995). *Integrating Pedestrian and Bicycle Factors into Regional Transportation Planning Models: Summary of the State-of-the-Art and Suggested Steps Forward*. Environmental Defense Fund, Washington, D.C.
- Saelens, B.E., Sallis, J.F., & Frank, L.D. (2003). Environmental correlates of walking and cycling: Findings from the transportation, urban design, and planning literatures. *Annals of Behavioral Medicine*, 25, 80-91.
- Sallis, J.F., Frank, L.D., Saelens, B.E. & Kraft, M. K. (2004). Active transportation and physical activity: opportunities for collaboration on transportation and public health research. *Transportation Research Part A: Policy and Practice*, 38, 4, 249-268.

- Sener, I., Eluru, N., & Bhat, C. (2009). An analysis of bicycle route choice preferences in Texas. Texas Department of Transportation.
- Tilahun, N., Krizek, K., & Levinson, D. (2007). Trails, lanes, or traffic: Valuing of different bicycle facilities with an adaptive stated preference survey. *Transportation Research Part A: Policy and Practice*, 41, 4, 287-301.
- Turner, S., Hottenstein, A., & Shunk, G. (1997). "Bicycle and pedestrian travel demand forecasting for existing and proposed transportation facilities. Texas Transportation Institute with Federal Highway Administration. Report no. 1723-1.
- Turner, T. (1996). *City as Landscape: A Post-Postmodern View of Design and Planning*. E & FN Spon, London.
- U.S. Census Bureau. (1990). Means of transportation to work for the U.S.:1990. Retrieved April 12, 2011 at <http://www.census.gov/population/socdemo/journey/usmode90.txt>
- U.S. Census Bureau. (2009). American Community Survey: Commuting Characteristics by Sex. Retrieved April 12, 2011 from http://factfinder.census.gov/servlet/STTable?_bm=y&-geo_id=01000US&-qr_name=ACS_2009_1YR_G00_S0801&-ds_name=ACS_2009_1YR_G00_&-_lang=en&-redoLog=false&-format=&-CONTEXT=st.
- Westervelt, E.T., & Fournier, D.F. (2005). Energy trends and implications for U.S. Army installations. US Army Corps of Engineers. Engineer Research and Development Center.
- Wilson, R. (2001). "Assessing communicative rationality as a transportation planning paradigm. *Transportation*. 28.
- Wright, Gerald C. 1993. "Errors in measuring vote choice in the national election studies". *American Journal of Political Science*, 37, 1, 291-316.
- Yin, R.K. (2009). *Case Study Research: Design and Methods*. 4th ed. Sage Publications, California.

APPENDIX A. Case Study Protocol

Research Questions and Subquestions	Theoretical Propositions	Sources of Evidence	What to Ask? What to Look For?
<p>Q1. How do cyclists make cycling work for them?</p> <p><i>Subquestions:</i> How does cycling fit into their lifestyles?</p> <p>What are the riders' experiences as they travel to post?</p> <p>How do they pick their routes?</p>	<p>P1. Cyclists commute by making decisions based on weather, route connectivity, time, and distance. In other words, they behave and make decisions in the same manner revealed by existing studies.</p>	<p>interviews route maps</p>	<p>How did you become someone who cycles? What do your family and friends think of you doing this? What advice would you give others who want to cycle? Take me through your route. What's it like? How are the conditions different?</p>
<p>Q2. How does their environment influence the cyclists' decision and ability to cycle?</p> <p><i>Subquestions:</i> How do cyclists perceive their current cycling environment?</p> <p>What was cycling like at other places?</p> <p>What would improve the cyclists' experiences?</p>	<p>P2. Individuals will report varying experiences according to location with respect to the city or military base's density, weather, active transportation facilities, and land use mix. These are common factors noted in the literature as impacting bicycling rates.</p>	<p>interviews policies observation</p>	<p>Have you been able to do this at other duty stations? What help do you get from community? What do you think about typical issues studied in bicycling? What makes a bicycle friendly community?</p>

APPENDIX B. Interview Protocol

Name of Study: Benefits and Barriers for Cyclists in the Fort Leavenworth, Kansas Area: A Qualitative Exploration of American Bicycle Culture

Type: Individual Face-to-Face Semistructured

Interviewer: Carolina Rodriguez

Interviewee: _____

Time: _____ **Date:** _____ **Place:** _____

Gender: _____ **Age:** _____ **Race:** _____

Icebreaker:

These questions and discussion prompts serve the purpose of putting both the interviewee and researcher at ease with each other.

Where are you from?

What brings you to Fort Leavenworth?

How do you like it so far?

Opening Statement and Instructions:

Before we begin the interview, I need to go over some information with you that I'm required to cover as a researcher representing the University of Kansas. The first is the consent form. The form explains the purpose of my study and what I plan to do with the information I collect. It also goes over the fact that I will maintain confidentiality and not identify you by name. And by signing, you acknowledge your voluntary participation in this study.

The interview should last about an hour and I'll be writing down a few notes as we go along. But to make sure I capture everything, I'll be recording our conversation. After I'm done transcribing the audio and with my thesis, I'll destroy the file. Again this is to guarantee your confidentiality.

Interview Questions with Potential Probes:

1. I'd like to start by asking about how you got into this. Take me through the history of how you've become someone who uses your bike for transportation to and from work?
 - a. Why are you riding your bike?
 - b. Tell me about how you learned to ride a bike?
 - c. Have you always biked to work at other duty stations or other places you worked?
 - d. How do you make this work? What sort of help do you get? From home? From Fort Leavenworth? From your neighborhood?

- e. What do other people think about you as someone who rides their bike to work?
 - f. Why is this important to you?
 - g. How does this fit in to the rest of your life?
2. Let's talk about your route. I have a map here and this is your house. So what's your route and what happens along the way? (Allow subject time to draw their route on map)
- a. Is this where you leave from every morning?
 - b. Where are you on sidewalks or on the street?
 - c. Where is the best part of your route?
 - d. What's the worst part?
 - e. Sensory--what do you see, feel, hear?
 - f. What do you do on days you don't bike?
3. Tell me all I need to know about how you decided this was the best route?
- a. Why is this the best route?
 - b. There are some factors that are commonly studied in bicycle and pedestrian planning. Let's talk about a few.
 - i. population
 - ii. design of the roads
 - iii. distance
 - iv. facilities for cyclists like bike lanes or parking racks
4. So let's pretend I am a friend of yours, maybe a colleague, and I've never ridden my bike to work before. I'm totally new at this, but I think I might want to give it a try. So one day I say to you "I'm going to give this bike thing a try--how do I make it work?"
- a. What advice would you give me?
 - b. What misconceptions might I have as a rookie that you might want to clear up?
5. The last question I want to ask you has to do with ideal conditions for you as a rider. So if I came to you one day and said, "it's time to turn this town into the most bicycle friendly community on earth, and we want your suggestions. And the one thing I can promise you is that your suggestions will be implemented".
- a. Tell me about how you would go about it.
 - b. What would you get rid of or keep?
 - c. What about on post vs. off post?